

What is claimed is:

1. A method for a reliability assessment, failure prediction and operating condition determination of electrical equipment comprising:  
    providing a profile of wear products and breakdown products; and  
    assessing reliability, and predicting failure and operating condition of the electrical equipment based on evaluation of the profile of wear products and breakdown products.
2. The method according to claim 1, wherein the step of providing a profile includes providing information pertaining to the presence of techtites.
3. The method according to claim 1, wherein the step of providing a profile includes providing information pertaining to the presence of filming, fibers, coking, techtites, ferrous and non-ferrous particles, oxides, and tempered metallic particles.
4. The method according to claim 1, wherein the step of providing a profile includes providing information pertaining to the presence of non-particulate components, including the presence of non-volatile insulating liquid degradation products.
5. The method according to claim 4, wherein the step of providing a profile includes providing information pertaining to the presence of hydrocarbons.
6. The method according to claim 4, wherein the step of providing a profile includes providing information pertaining to the presence of hydrocarbons, water, nitrates, alkanes, hydroxyls, oxides, sulfates, coking and viscosity.
7. The method according to claim 4, wherein the step of providing a profile includes providing information pertaining to the particle count, particle count distribution, particle count concentration, particle count composition, particle count shape, coking, oxidation, nitration, sulfate, alkanes, moisture, particle type composition, particle size and particle shape.

8. The method according to claim 1, wherein the step of assessing reliability, and predicting failure and operating condition includes comparing the profile to a standardized profile.
9. The method according to claim 1, wherein the electrical equipment is selected from the group consisting of transformers, load tap changes, tap changers, circuit breakers, off-load tap changes, on-load tap changers, switches, x-ray machines and electrical discharge machines.
10. The method according to claim 1, wherein the electrical equipment is an electric power transfer device.
11. An electrical equipment operating condition determination method comprising:  
providing a profile of wear products and breakdown products; and  
assessing reliability, and predicting failure and operating condition of the electrical equipment based on evaluation of the profile of wear products and breakdown products.
12. The method according to claim 11, wherein the step of providing a profile includes providing information pertaining to the presence of techtites.
13. The method according to claim 11, wherein the step of providing a profile includes providing information pertaining to the presence of filming, fibers, coking, techtites, ferrous and non-ferrous particles, oxides, and tempered metallic particles.
14. The method according to claim 11, wherein the step of providing a profile includes providing information pertaining to the presence of non-particulate components, including the presence of non-volatile insulating liquid degradation products.
15. The method according to claim 14, wherein the step of providing a profile includes providing information pertaining to the presence of hydrocarbons.
16. The method according to claim 14, wherein the step of providing a profile includes providing information pertaining to the presence of hydrocarbons, water, nitrates, alkanes, hydroxyls, oxides, sulfates, coking and viscosity.

17. The method according to claim 14, wherein the step of providing a profile includes providing information pertaining to the particle count, particle count distribution, particle count concentration, particle count composition, particle count shape, coking, oxidation, nitration, sulfate, alkanes, moisture, particle type composition, particle size and particle shape.

18. The method according to claim 11, wherein the step of assessing reliability, and predicting failure and operating condition includes comparing the profile to a standardized profile.

19. The method according to claim 11, further comprising:  
obtaining a sample of insulating liquid from the electrical equipment;  
analyzing the insulating liquid for the presence of wear products and breakdown products to determine the profile of wear products and breakdown products.